3rd UPI International Conference on Technical and Vocational Education and Training

"Approaches and Achievements in TVET Personnel Professional Development"

7th National Convention of The Indonesian Association of Technical and Vocational Education

"Strengthening the LPTK's Role to Improving Teacher Quality and Technical and Vocational Education in Indonesia"

Bandung (Indonesia), 12-15 November 2014

APTEKINDO
Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia

UTHM
Universiti Tun Hussein Onn Malaysia

RAVTE
Regional Association for Vocational Teacher Education

Organized by: **Faculty of Technology and Vocational Education Universitas Pendidikan Indonesia** in cooperation with: Universiti Tun Hussein Onn Malaysia | Regional Association for Vocational Teacher Education in Asia (RAVTE) | Kementerian Riset, Teknologi dan Pendidikan Tinggi | Asosiasi Pendidikan Teknologi dan Kejuruan Indonesia (APTEKINDO)

UPI International Conference on TVET

Message from Rector of Universitas Pendidikan Indonesia

Your excellency, Director General of Higher Education (DGHE), Ministry of Research, Technology, ad Higher Education of Republic of Indonesia.

Invited speakers, Presenters and articipants of the TVET Conference.

Distinguished Guests, Ladies and Gentlemen.

It is my great honour and pleasure that I can welcome you here to our University, Universitas Pendidikan Indonesia (UPI) in Bandung, in connection with the conduct of the very important events, the **3rd UPI International Conference on TVET**. This conference takes theme "Approaches and Achievements in TVET Personnel Development."

This TVET Conference is intended to be the third of a series of biannual TVET conferences that bring together all level actors of the global TVET sector for exchange of knowledge and of examples of good practice of collaboration in TVET at all levels, and in order to start mapping the global landscape of collaboration in TVET, especially in Asia.

The conference is organised by Faculty of Technology and Vocational Education, Universitas Pendidikan Indonesia, in cooperation with Universiti Tun Hussein Onn Malaysia, the Regional Association for Vocational Teacher Education in Asia (RAVTE)—formerly the Regional Cooperation Platform for Vocational teacher Education in Asia (RCP), and the Indonesian Association of Technical and Vocational Education (Aptekindo).

Recently, TVET has found its way back on national and international development agendas. In the light of the immense importance of TVET for social and economic development, collaboration of all stakeholders at all levels is the critical issue for TVET development, starting from local cooperation between TVET institutions and the corporate sector for improving the quality and relevance of TVET, via regional cooperation in the framework of Free Trade Agreements (FTA) and ASEAN Economic Community in 2015, and mobility of labor in order to make TVET qualifications transparent and transferable over national boarders, up to international cooperation in TVET research and development for developing national knowledge bases for TVET system and TVET quality development.

Under the main theme "Approaches and Achievements in TVET Personnel Development", the conference will be organized along the sub-themes: (1) Professionalization Approaches and Experiences in Initial Teacher/Trainer Education and Continuing Professional Development; (2) The Contribution of Vocational Disciplines and Vocational Pedagogy to the Professionalization of TVET Staff; (3) The Role of Work Practice and Experience in TVET Teacher/Trainer Professionalization.

This year's conference is special because it is conducted in conjunction with the 7th National Convention of the Indonesian Association of Technical and Vocational Education (Aptekindo), which carries the theme "Strengthening the LPTK (Educational Institutions of Higher Education)'s Role to Improving Teacher Quality and Technology and Vocational Education in Indonesia." It is expected that both events will enrich each other by contrasting up-to-date Indonesian development efforts with world-wide experiences.

I recognize that the sessions are principally designed to enhance the development and cooperation of TVET.This conference enables the building of a productive discussion, also provides an invaluable opportunity for networking and fruitful contacts between countries.

I realize that you are fully dedicated to the sessions that will follow but I do hope you will also take time to enjoy the fascinating Bandung City with its tropical setting, friendly people and multi-cultural delicious cuisines.

Finally, I would like to express our heartfelt thanks to the Scientific and Organizing Committee for enabling this to take place, to all sponsors and to everybody who comes to this conference. I wish we will have a very productive and successful conference.

Thank you.

Bandung, 13th of November 2014

Rector of UPI

Prof. Dr. Sunaryo Kartadinata, M.Pd.

Message from the Chair of the Scientific Committee

Competition and collaboration are the main keywords that would be coloring the development of economic, social and education in the present and the future. In the context of relation between education and employment sector, competition will involve the existence of occupational chance which depends on the economic development in a side, and total number, expertise relevance, and human resources quality that are resulted by educational institution on the other side. Collaboration, both inter educational vocational institution and educational institution with industries, is urgently needed to build the balance of the competition.

The institution of technical and vocational education and training (TVET) should be able to response the competition challenge through the effort of increasing the quality standard, either from input, process or output aspect. The output aspect for instance, TVET graduates should not only be able to compete in local scale, but also should be ready to face a regional and international competition. The integration of ASEAN Economic Market in 2015 is the closest challenge. Consequently, the educational process in TVET institution should require an international standard quality.

On the other hand, collaboration is needed for exchanging knowledge, experience and brilliant ideas to build a beneficial cooperation. This collaboration would succeed if it is grounded by three things. First, strong willingness and commitment from each side to cooperate. Second, partner institution should have high curiousity and be able to analyze the situation needed by the partner. Third, collaboration will only happen and effectively work if both sides are able to build a beneficial situation and giving profits for both sides.

Thus, the willingness to collaborate, exchange knowledge, and give experience are factors to encourage lecturers, scientists, experts and stakeholders to participate in this conference. This current event is the third conference from the biennial international conference series that is arranged and held by Fakultas Pendidikan Teknologi dan Kejuruan, Universitas Pendidikan Indonesia (FPTK-UPI). FPTK UPI is associated with the Regional Association for Vocational Teacher Education in Asia (RAVTE). RAVTE is a succeeding, independent and exclusive body resulting from the former "Regional Cooperation Platform for Vocational Teacher Education in Asia (RCP)", a German funded regional project of the "Federal Ministry for International Cooperation and Development (BMZ).

The 3rd UPI International Conference is carrying a theme of “Approaches and Achievements in TVET Personnel Professional Development”. In parallel to the 3rd UPI International Conference, the Indonesian Association of Technical and Vocational Education (APTEKINDO) will organize its 7th National Convention focusing on the theme “Strengthening the LPTK (Educational Institutions of Higher Education)’s Role to Improving Teacher Quality and Technology and Vocational Education in Indonesia.” It is expected that

both events will enrich each other by contrasting up-to-date Indonesian development efforts with world-wide experiences.

I hope that all of us as participant, presenter, and committee would get a huge benefit from this conference. The conference could give contribution as problem solving for all of us in encouraging vocational education teacher and as the forum to continue the cooperation between individual and institutional of vocational education teacher. As the closure, I congratulate you all to attend and catch knowledge from this conference, I would like to apologize for the flaws of service that is given by this conference.

Bandung, November 2014

Prof. Dr. M. Syaom Barliana
(Chair of the Scientific Committee)

TVET-01-029

SIMULATION LABORATORY MODEL INTEGRATED WITH SMARTPHONE AS A COMPLEMENT OF REAL LAB FOR VOCATIONAL SCHOOL STUDENTS

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Abstract

The existence of a smartphone (HP) has a special phenomenon for education especially for students. Presence that offers sophistication to be able to access all information across the world with a very fast, easy and inexpensive. Communication tools on smartphones is now not a luxury, and almost have the bulk of vocational students. Fact the field after observation found that many high school / vocational school equipment and materials that have very minimal practice, there are even schools that do not have laboratory space, so that the lab is not running optimally. Hope students are gaining the knowledge and experience of learning outcomes, while the teacher's expectations are practical learning process toward the achievement of cognitive changes, psychomotor, and ultimately change the character of students. This research is the development research in which design is selected development using multimedia development model. Because the primary response generated in the form of a software research, then in the process of media development will be equipped with software development method using the Software Development Life Cycle (SDLC) with Waterfall - based model. Laboratory simulation models integrated into samartphone in this case using a blackberry Z10 can be used by students as a means of practice activities with animation and interactive simulations, thus through this medium may indirectly be a complement to the real laboratory.

Keywords: Simulation Laboratory, smartphone.

TVET-01-031

TVET TEACHERS, A COMPARISON OF TRENDS IN INDONESIA AND AUSTRALIA

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Abstract

Australian preparation of TVET teachers is minimalist, with a deprofessionalisation of an increasingly casualised workforce for a system experiencing policy, systemic and financial challenges. In the Australian context there are concerns for the quality, delivery and outcomes of the TVET sector. Opportunities for learners, and the impact on the societal context from policies and reduced financial support, are diminishing opportunities to undertake TVET education and training. These trends are not inspiring for supporters of a public VET sector: with government encouragement for market driven private provision of VET increasing, minimum level qualifications for VET educators accepted as the maximum, and quality of training provided questionable. Staff numbers and courses in public sector VET have been cut dramatically over the past two years. Indonesia on the other hand is emphasizing more vocational education and training for young people to raise the status of TVET. 'The government, aiming to reduce high unemployment rates among educated youth, pledged to reverse the current share of high school students, from 70 percent general to 70 percent vocational by 2015' (Newhouse & Suryadarma, p.2). This goal will contribute new demands for TVET teachers. These two TVET systems present both similar and differing responses to such issues.

DAFTAR PEMAKALAH SEMINAR NASIONAL APTEKINDO
KATEGORI : PRESENTASI POSTER

Tata Tertib Presentasi Poster :

- Bahasa yang digunakan : Bahasa Indonesia
- Isi poster harus mengandung informasi : Latar Belakang, Metode dan Hasil Penelitian.
- Presenter mempersiapkan secara mandiri poster yang akan ditempelkan pada panel yang sudah disediakan sesuai dengan kode makalahnya.
- Pada panel dapat terlihat kode makalah untuk setiap poster.
- Presentasi poster dilaksanakan sesuai jadwal yang sudah ditentukan dan dilaksanakan di gedung FPTK UPI.
- Ukuran kertas untuk poster adalah A2 (420mm x 594mm) dengan orientasi portrait.
- Template poster dapat didownload pada website resmi konferensi APTEKINDO.
- Poster ditempelkan menggunakan double tip yang sudah disediakan panitia.
- Pada saat presentasi poster berlangsung, para presenter diwajibkan berdiri di samping posternya masing-masing untuk melayani pertanyaan peserta konferensi.
- Presenter poster yang tidak dapat hadir pada presentasi poster hanya akan mendapatkan sertifikat sebagai peserta saja.
- Poster sudah dapat ditempel pada panel yang sudah disediakan mulai hari Kamis 13 Nopember 2014 pukul 07:30 dan dapat dicabut kembali oleh masing-masing peserta pada hari Jum'at 14 Nopember 2014 pukul 15:00.
- Panitia akan memberikan penghargaan poster terbaik 1, 2 dan 3 dalam bentuk piagam penghargaan dan cindera mata (diumumkan pada saat acara penutupan)

SUBTEMA I

KODE	JUDUL MAKALAH	PENULIS	AFILIASI
APT-01-001	PROFESIONALISME GURU DALAM MEMBANGUN DAN MENGEMBANGKAN PENDIDIKAN VOKASIONAL SEKARANG DAN SELAMANYA	B. Limbong Tampang	UNIMA
APT-01-003	KAJIAN TENTANG PROGRAM PENDIDIDKAN PROFESI GURU TERHADAP EKSISTENSI LPTK	Irma Yulia Basri	UNP
APT-01-004	MANFAAT HASIL BELAJAR SULAMAN BERWARNA PADA PEMBUATAN HIASAN BUSANA PESTA WANITA	Marlina	UPI
APT-01-006	PERAN LPTK DALAM MEMBENTUK GURU VOKASIONAL YANG PROFESIONAL	Paulina Thomas	UNIMA
APT-01-008	MENYIAPKAN GURU PROFESIONAL DI SMK TEKNIK KENDARAAN RINGAN (TKR)	Agus Budiman	UNY
APT-01-009	PEMBELAJARAN BERBASIS TEMPAT KERJA DALAM PENYELENGGARAANPROGRAM S1 PROFESI GURU PENDIDIKAN TEKNOLOGI DAN KEJURUAN	Budi Tri Siswanto	UNY
APT-01-010	MODEL PENGEMBANGAN PROFESIONALISME GURU VOKASI	Rolly R. Oroh	UNIMA
APT-01-012	PENERAPAN MODEL KOOPERATIF BERBASIS MEDIA DALAM MENINGKATKAN PEMBELAJARAN PRAKTEK SURVEY DAN PEMETAAN	Sukatiman	UNS Surakarta

APT-01-013	KORELASI INTEGRASI MATA PELAJARAN DAN GURU DI SEKOLAH MENENGAH KEJURUAN (SMK) PADA KURIKULUM 2013	Nibras Fitrah Yayienda	UNESA
APT-01-014	PENGINTEGRASIAN SOCIAL COGNITIVE PADA KURIKULUM S1 PENDIDIKAN TEKNIK ELEKTRO LPTK UNTUK MEMFASILITASI KEMAMPUAN BERADAPTASI CALON GURU KEJURUAN	Setiadi Cahyono Putro	UM
APT-01-015	PENINGKATAN KOMPETENSI PROFESIONAL PRAMUSAJI RESTORAN DI SUMATERA BARAT	Ira Meirina	UNP
APT-01-016	SIMULATION LABORATORY MODEL INTEGRATED WITH SMARTPHONE AS A COMPLEMENT OF REAL LAB FOR VOCATIONAL SCHOOL STUDENTS	Sapto Haryoko, Hendra Jaya	UNM
APT-01-017	KOMPETENSI PROFESIONAL GURU MELALUI PEMAHAMAN MATA DIKLAT PRAKTEK KAYU	Harijono	Universitas Nusa Cendana
APT-01-018	PENGARUH PENGGUNAAN MEDIA BERBASIS ADOBE FLASH CS3 DAN MEDIA GAMBAR TERHADAP HASIL BELAJAR INSTALASI PENERANGAN LISTRIK PADA SISWA SEKOLAH MENENGAH KEJURUAN NEGERI	Baharuddin	UNIMED
APT-01-019	RANCANG BANGUN TESTER IC DIGITALSEBAGAI ALAT UJI DAN ALAT BANTU UNTUK MENINGKATKAN PEMBELAJARAN PRAKTIKUM DI LABORATORIUM JURUSAN TEKNIK ELEKTRO UNIVERSITAS NEGERI SURABAYA	Nur Kholis	UNESA
APT-01-020	SIMULATOR GANGGUAN SISTEM PENGISIAN OTOMOTIF: ALTERNATIF SOLUSI UNTUK MENINGKATKAN KEMAMPUAN MENDIAGNOSIS SISTEM PENGISIAN BAGI CALON GURU TEKNIK OTOMOTIF	Dwi Widjanarko, Abdurrahman, Hadromi	UNNES
APT-01-021	IMPLEMENTASI MODEL PEMBELAJARAN BERBASIS WORKSHOP UNTUK MENINGKATKAN KOMPETENSI PENGUKURAN LISTRIK	Rosnelli	UNIMED
APT-01-023	PENGEMBANGAN MODEL PENDIDIKAN VOKASI YANG EFEKTIF DAN EFISIEN	Dina Ampera	UNIMED
APT-01-025	PELATIHAN KEWIRAUSAHAAN PENGOLAHAN BENGKUANG SEBAGAI UPAYA PENINGKATAN KETERAMPILAN DAN EKONOMI KELUARGA	Wirnelis Syarif, Waryono	UNP
APT-01-026	KAJIAN ALTERNATIF PERANAN PROGRAM STUDI KEPENDIDIKAN PADA SUATU LEMBAGA PENDIDIKAN TENAGA KEPENDIDIKAN SEBAGAI PENGHASIL GURU PROFESIONAL	Tasma Sucita	UPI
APT-01-027	PENGEMBANGAN PROFESIONALISME DOSEN	Andrizal	UNP
APT-01-028	MODEL PENDIDIKAN GURU VOKASIONAL YANG PROFESIONAL MENUJU GENERASI EMAS	Amos Neolaka	UNJ
APT-01-032	ANALISIS PENGEMBANGAN KURIKULUM PENDIDIKAN TEKNIK MESIN UNIVERSITAS NEGERI JAKARTA TERINTEGRASI DALAM KERANGKA KUALIFIKASI NASIONAL INDONESIA (KKNI)	Imam Mahir, Ahmad Kholil	UNJ

Kode : APT-01-015

PENINGKATAN KOMPETENSI PROFESIONAL PRAMUSAJI RESTORAN DI SUMATERA BARAT

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ABSTRAK

Sumatera Barat merupakan salah satu destinasi wisata unggulan di Indonesia, memiliki alam yang mengundang decak kagum, sejarah yang terawat dan budaya yang unik serta wahana wisata modern, sehingga menjadi magnet bagi wisatawan. Untuk menunjang pariwisata ini, diperlukan akomodasi dan fasilitas yang memadai, salah satunya adalah penyediaan industri jasa boga antara seperti restoran.Persaingan bisnis restoran di Sumatera Barat cukup ketat, sehingga setiap restoran jika ingin meningkatkan pendapatannya selain meningkatkan kualitas produk juga harusmeningkatkan kualitas pelayanannya. Keadaan yang demikian diperlukan sumber daya manusia yang profesional di bidangnya masing-masing, khususnya pelayan makan dan minum yang biasa disebutpramusaji.Pramusaji yang profesionaladalah ujung tombak dari bisnis restoran, karena berhadapan langsung berhadapan dengan tamu. Seorang tamu akan merasa senang dan puas bila dilayani oleh pramusaji profesional yang mempunyai *appereance, attitude, knowledge & skill* yang mantap. Disamping pramusajijuga harus menguasai pengetahuan dan keterampilan serta sikap di bidang pelayanan makanan.

Kata Kunci : Pramusaji restoran, kompetensi professional

Kode : APT-01-016

SIMULATION LABORATORY MODEL INTEGRATED WITH SMARTPHONE AS A COMPLEMENT OF REAL LAB FOR VOCATIONAL SCHOOL STUDENTS

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ABSTRAK

The existence of a smartphone (HP) has a special phenomenon for education especially for students. Presence that offers sophistication to be able to access all information across the world with a very fast, easy and inexpensive. Communication tools on smartphones is now not a luxury, and almost have the bulk of vocational students. Fact the field after observation found that many high school / vocational school equipment and materials that have very minimal practice, there are even schools that do not have laboratory space, so that the lab is not running optimally. Hope students are gaining the knowledge and experience of learning outcomes, while the teacher's expectations are practical learning process toward the achievement of cognitive changes, psychomotor, and ultimately change the character of students. This research is the development research in which design is selected development using multimedia development model. Because the primary response generated in the form of a software research, then in the process of media development will be equipped with software development method using the Software Development Life Cycle (SDLC) with Waterfall - based model.Laboratory simulation models integrated into samartphone in this case using a blackberry Z10 can be used by students as a means of practice activities with animation and interactive simulations, thus through this medium may indirectly be a complement to the real laboratory.

Kata Kunci : Simulation Laboratory, smartphone.

Pre-Poceedings
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Abstract

The existence of a smartphone (HP) has a special phenomenon for education especially for students. Presence that offers sophistication to be able to access all information across the world with a very fast, easy and inexpensive. Communication tools on smartphones is now not a luxury, and almost have the bulk of vocational students. Fact the field after observation found that many high school / vocational school equipment and materials that have very minimal practice, there are even schools that do not have laboratory space, so that the lab is not running optimally. Hope students are gaining the knowledge and experience of learning outcomes, while the teacher's expectations are practical learning process toward the achievement of cognitive changes, psychomotor, and ultimately change the character of students. This research is the development research in which design is selected development using multimedia development model. Because the primary response generated in the form of a software research, then in the process of media development will be equipped with software development method using the Software Development Life Cycle (SDLC) with Waterfall - based model. Laboratory simulation models integrated into samartphone in this case using a blackberry Z10 can be used by students as a means of practice activities with animation and interactive simulations, thus through this medium may indirectly be a complement to the real laboratory.

Key Words: Simulation Laboratory, smartphone.

1 Introduction

Currently, many mobile phones of various brands circulating in the community. Indonesia is the world's largest market for mobile phone vendors. Average Indonesian people have more than one mobile phone per person. The use of mobile phones used by the public lot. It is not independent of several factors such as: cellular telephone network infrastructure that has been constructed in the entire country. In addition, the cost of use (for new temporary conversation costs) should be fairly cheap. And factors completeness of existing features in a mobile phone is its own attraction for people not to bring cell phones off wherever they go.

The Mobile Phone (HP) has a special phenomenon for education especially for students. Presence that offers sophistication to be able to access all information across the world with a very fast, easy and cheap. Hand Phone communication tool at this time had not a luxury, and almost most of high school students have. The existence of such a device can be perceived benefits to establish communication between friends and even between students and teachers or vice versa. In communities such objects are not exclusive items, something unusual. When there is a

prohibition to bring hp to school in high school, became something odd, because the age of high school students, is a critical period that is able to bring the child to a critical attitude towards himself and his environment (also the products of technology), and the public has been able to accept the presence of these technologies . It can even be used as HP tech products as research subjects, modified into a remote to turn off the electricity in the home network. If so HP is actually the objects around us that can be manipulated to meet a variety of needs for the welfare of mankind.

Fact the field after the observation is found that there are many high school / vocational school equipment and materials that have very minimal practice, there are even schools that do not have laboratory space, so that the process is not running optimally practicum (Hendra, 2013). Hope students are gaining the knowledge and experience of the results of their study, while teachers' expectations are practical learning process toward the achievement of cognitive changes, psychomotor, and major changes in the character of students (Muslich, 2010).

To overcome these problems, in this research will be developed laboratory-based simulation models of smartphones by utilizing a cell phone blackbery application in this case as a means of practical activities with animation and 3-dimensional simulations (Henderson, 2013). Based on the background of the problem dikemukakakan above, the purpose of this research is formulated as follows: 1) to determine how to develop an integrated simulation model of a laboratory with a smartphone (Blackberry) that can facilitate the practicum process fun for students; 2) to determine how the application of laboratory simulation integrated with smartphones (Blackberry) can facilitate the process of practical vocational students.

Nuri Adiyati (2012) research results showed that the reason of the background learner / student to use a BlackBerry is family, friends, trends, features, needs. Students who use the BlackBerry is not only from the economic but also from the upper middle class and the down economy, it shows that the socio-economic status does not affect the students in using the BlackBerry. BlackBerry gives the role of the student lifestyle to look different with his friends. The positive impact of the use of the BlackBerry is (1) to support the business, (2) makes it easy to browse, (3) make it easier to communicate.

Research Sapto Haryoko (2013) developed a touchscreen-based virtual laboratory as a means of simulations that are used for productive subjects of vocational schools. Development of touchscreen-based virtual lab is done through the existing architecture and organization in a virtual laboratory which includes studio room, user interface, virtual simulation modeling, interactive tools, visual representation, virtual workspace, and authoring tools. While the research conducted Hendra Jaya (2012) who also developed a virtual laboratory for digital electronics subjects, found that media-based virtual lab can facilitate character education through the RPP and Jobsheet made fitted / facilitated with character education approach.

The virtue of this study are: 1) The creation of a laboratory-based simulation model of the Blackberry smartphone, is expected to address issues such as limitations on conventional lab time and place carry out lab, lab equipment is still limited because of the high cost of equipment and maintenance costs, and eliminate the assumption that the activity practicum is a difficult and tedious subjects; 2) Increasing the effectiveness of the learning process after the implementation of the media lab practicum-based simulation Blackberry smartphones; 3) Through the medium of the Blackberry smartphone-based simulation lab is expected to provide high school students' science skills and vocational skills of vocational students before entering college level and industry.

2 Methods

This research is the research and development which refers to the development of Borg & Gall (2003), further design development of the selected media is multimedia development model Lee & Owens (2003). Because the major outcomes that will be generated in the form of a software research, then in the process of media development will be equipped with a special method of software development using the Software Development Life Cycle (SDLC) with Waterfall-based model.

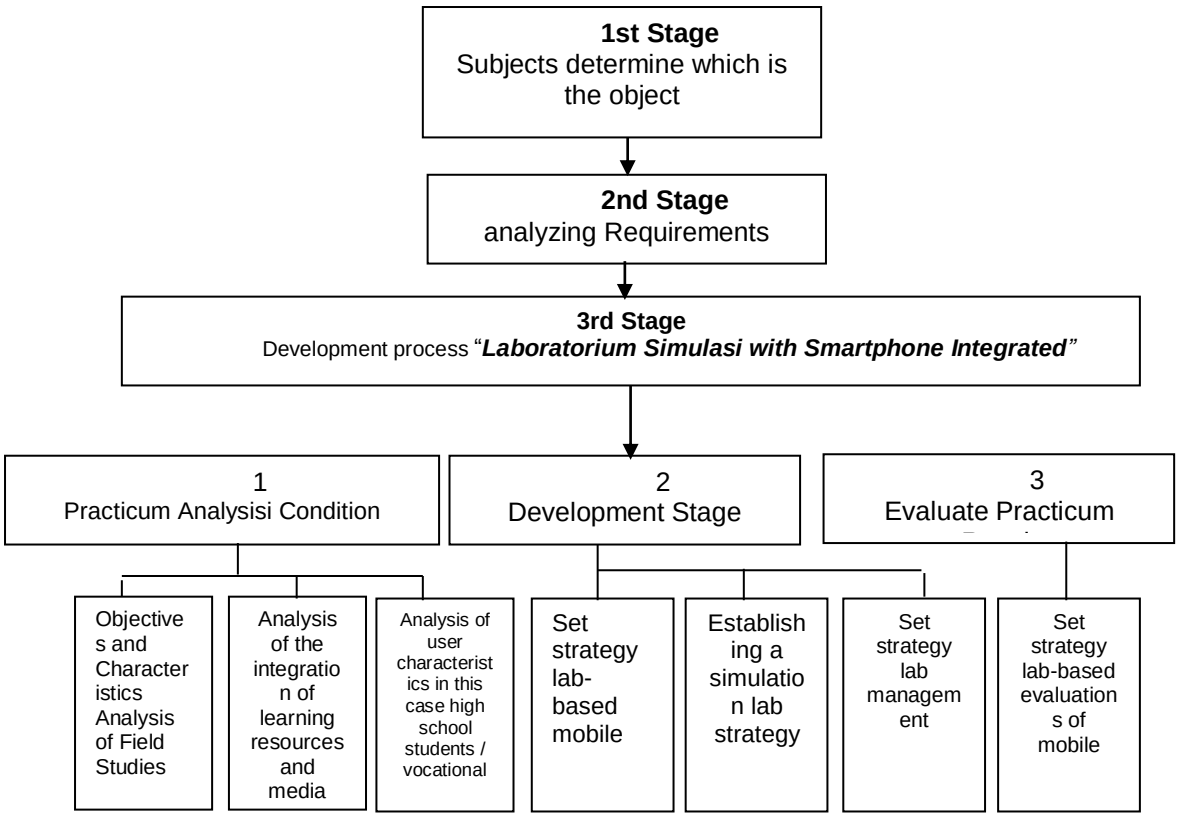

Figure 0. Design Development of Simulation Laboratory Integrated with Smartphone

Because the media developed in this study will result in the development of the final product in the form of software simulation program, then the third stage will be followed by the fourth stage of the design development adapted to the method is a method of software development Software Development Life Cycle (SDLC) with the Waterfall Model. The fifth stage is the last stage of the design development of instructional media, which at this stage of software testing as a learning medium that includes: testing the media expert.

3. Result And Discussion

The process of developing smartphone-based Simulation Laboratory in this study begins with some stage of the analysis of the programming needs to be built, the support of the media, then after the completed software will be testing / debugging, packagging to the monitoring and evaluation.

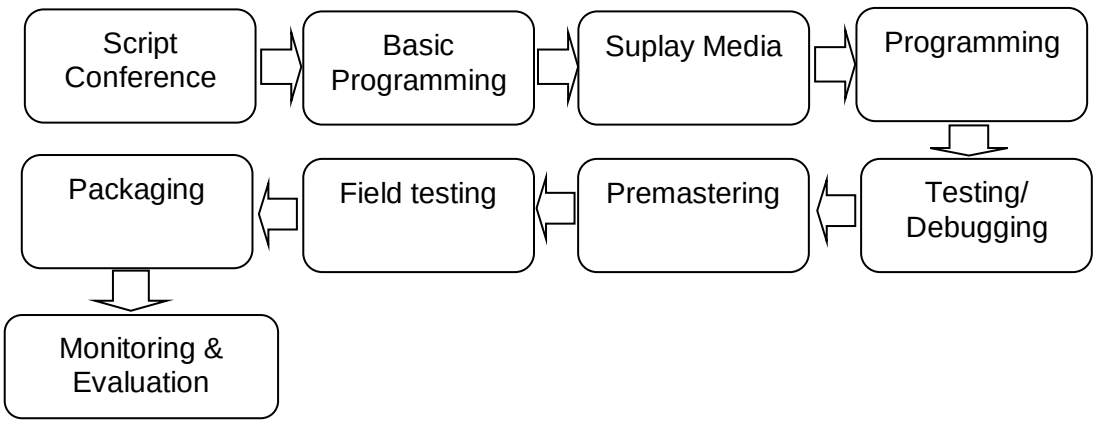

Fig 1. Development Stage, Production, and Implementation

Once the mobile learning program has been written and validation by media experts, the next stage is the stage of development / production. This development phase is based on expert advice from the media. Users come from the teachers and students who have been given a password and username. Design lab simulations adopting existing activities in the virtual lab include: modify, construct, inject, measure, and Evaluate as shown in Figure 2 below. In the activity students will make modifications to the lab what to do, then do the splicing of each component based on image sequence given in the area of "work screen", then the theory is proven through a series of tests that have been built. In laboratory simulations are also facilitated with a measuring instrument for measuring the output circuit.

Laboratory simulation software built using Macromedia Flash Prof 8 to show the effects of animation and interactivity to medium build. Laboratory simulations that have been built further integrated with blackberry smartphone types. One way to use Adobe Air as shown in Figure 3

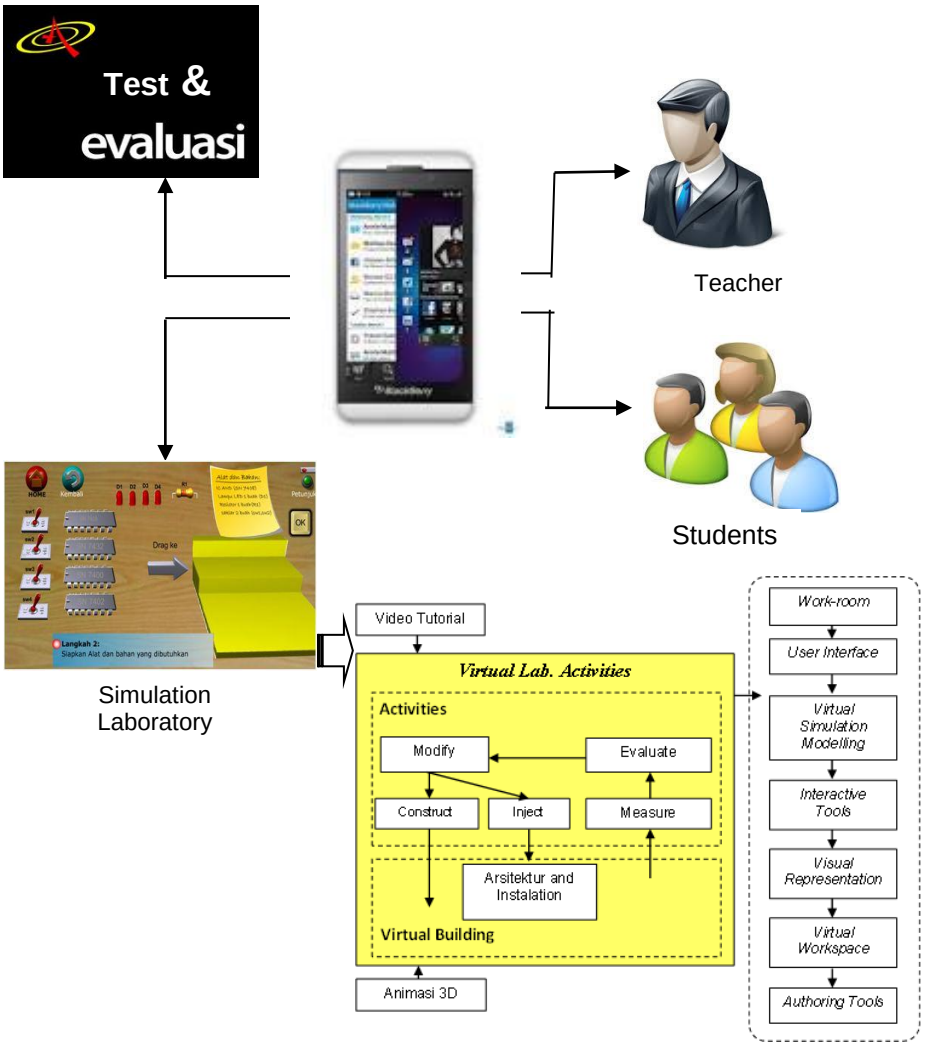

Fig 2. Development Stage, Production, and Implementation

Fig 3. Process of Integration to Smartphone

Compilation to the bar requires ingredients such as: a) Internet; b) Black Berry Graphical Aid; c) Java JDK version 1.7.0 / latest; d) Developer Cert Password, Code Signing Key, files (Client-PBDT-xxxxx.CSK and Clint-RDK-xxxxxx.csk) all obtained when Order Sign Key; e) Application Icon 128x128 pixel resolution; f) Bar-descriptor.xml. The steps are as follows (Figure 4).

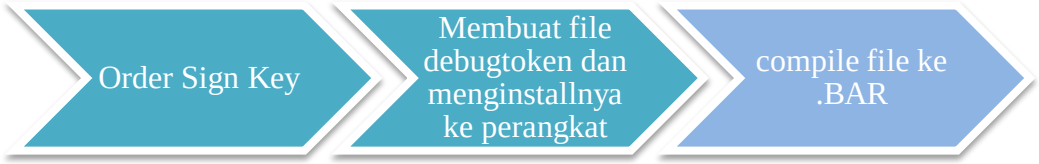

Fig 5. compile Process to bar

The next stage is to create a Debug Token. Debug tokens is done in order to install applications offline via computer. Debug token installation is done once and is valid for Blackberry devices for 10 days. But the important thing to do is to enable Development mode mode on the Blackberry device by going to settings and select the mode of development and change to ON. The first stage is done is to install the Blackberry Graphical Aid, then opened the token debug tab (Figure 6), so that will be generated files (.bar) as shown in Figure 7.

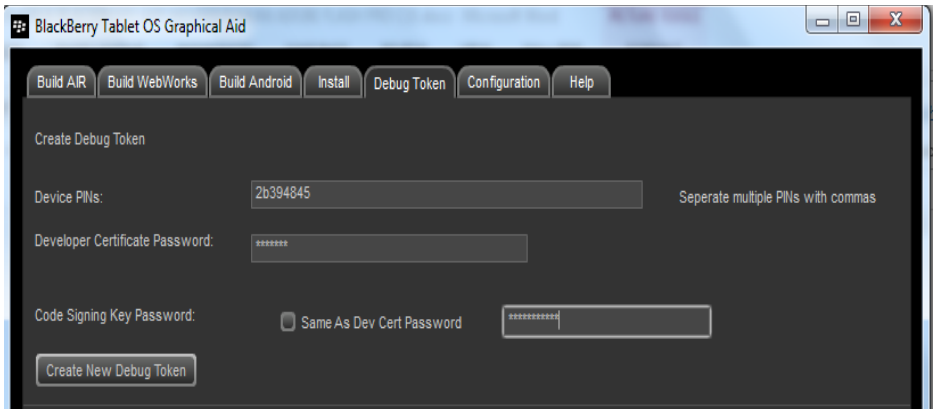

Fig 6. Debug Token Display

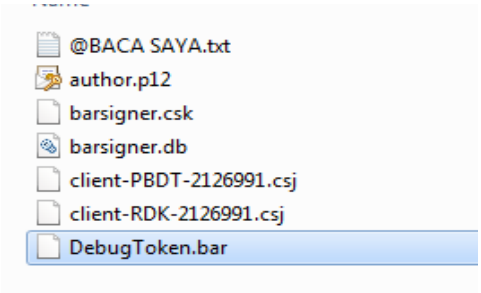

Fig 7. Debug Token Result

The last stage is to install debug token to smartphone blackberry (Figure 8). To install the file please find the location where you save the debug token.bar. The results are shown in Figure 9.

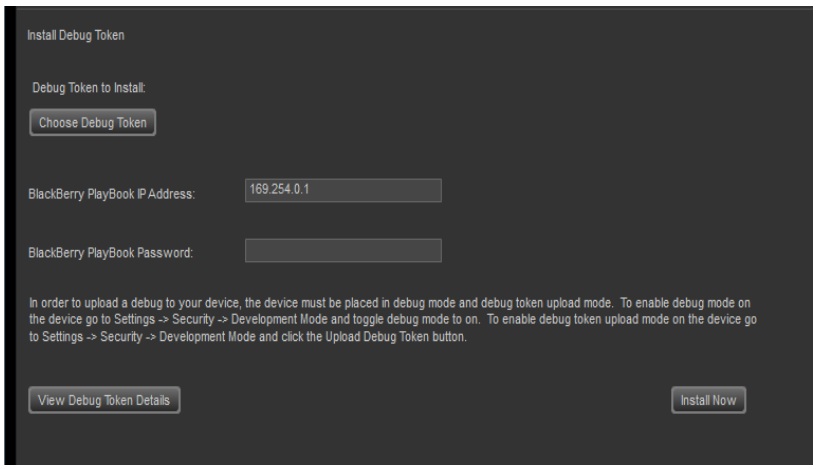

Fig 8. Installation Simulation Laboratory to Smartphones

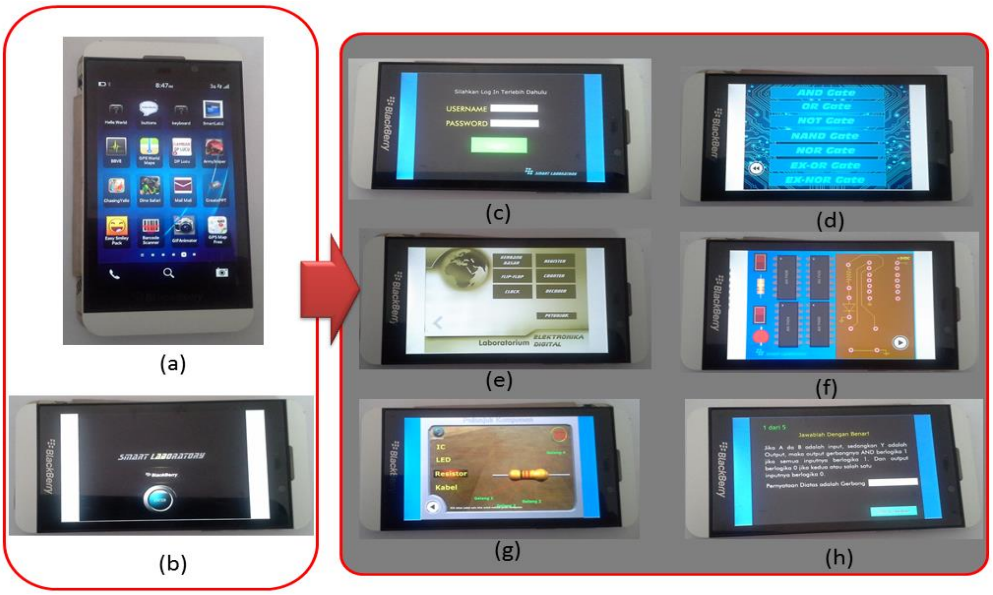

Fig 9. Simulation Lab Integrated via Smartphone. a) Menu Simulation laboratory; b) Main Menu; c) Username & Password; d) Menu Praktikum; e) Menu Simulation Labl; f) "work screen" menu; g) ools and materials; h) exercises.

To see if a device developed is feasible to use eating required assessment by media experts. Furthermore, media experts Assessment results are shown in Table 1.

Tabel **1**. Media Expert Assessement

NO.	ASPEK	RERATA JUMLAH SKOR
I.	Audio Visual	4,45
II.	Virtual Aspect	4,50
III.	Pemrogramming Aspect	4,41
IV	Integrated Via Smartphone	4,52
Rerata Skor Keseluruhan		**4,47**

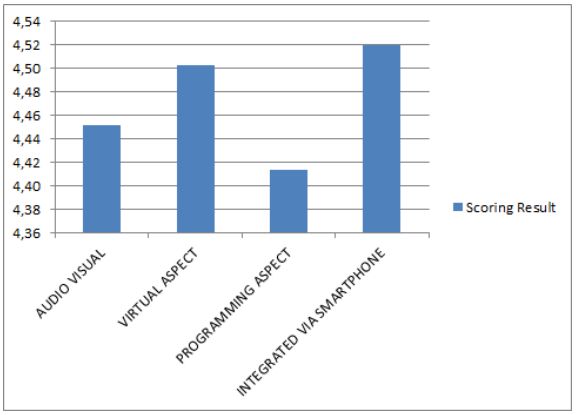

Figure 10. Graphics of Media Expert Assessment of the laboratory simulation models integrated with smartphone

Based on the expert judgment of the display media (audio-visual) consisting of text clarity indicator, Language, Picture, Color, Music, Layout, Animation, Simulation, Button, and the resolution obtained overall mean score of 4.45 or very good. The second assessment is a virtual aspect which consists of indicators Explanation Abstract Concepts and Complex, Real Application, Form Practicum, completeness, Animation Techniques and Images 3-D, Proof Theory, Methodology obtained a mean score of 4.50 or very good overall. The third assessment is a programming aspect Pemrogrman terdirib above indicators, Interaction, Navigation, Animation, Simulation, efficiency obtained overall mean score of 4.41 or better and the last assessment was obtained smartphone integration via the overall mean score of 4.52 or very good.

CONCLUSSION

Integration of laboratory simulation methodology through blackberry smartphone devices in the lab is done through the existing architecture and organization of the virtual lab include: modify, construct, inject, measure, and Evaluate. The results of the simulation media expert assessment of laboratory models are integrated with a smartphone with a very good 4.47.

Laboratory Simulation can play a supportive (supplement of the real lab) on a conventional laboratory in secondary schools, especially vocational schools. It is integrated with a smartphone makes it more portable and more attractive.

ACKNOWLEDGMENT

Acknowledgements to DP2M Dikti and Black Berry Innovation Center (BBIC) ITB Bandung.

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SIMULATION LABORATORY MODEL INTEGRATED WITH SMARTPHONE AS A COMPLEMENT OF REAL LAB FOR VOCATIONAL SCHOOL STUDENTS

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ABSCTRACT

The existence of a smartphone (HP) has a special phenomenon for education especially for students. Presence that offers sophistication to be able to access all information across the world with a very fast, easy and inexpensive. Communication tools on smartphones is now not a luxury, and almost have the bulk of vocational students. Fact the field after observation found that many high school / vocational school equipment and materials that have very minimal practice, there are even schools that do not have laboratory space, so that the lab is not running optimally. Hope students are gaining the knowledge and experience of learning outcomes, while the teacher's expectations are practical learning process toward the achievement of cognitive changes, psychomotor, and ultimately change the character of students. This research is the development research in which design is selected development using multimedia development model. Because the primary response generated in the form of a software research, then in the process of media development will be equipped with software development method using the Software Development Life Cycle (SDLC) with Waterfall - based model. Laboratory simulation models integrated into samartphone in this case using a blackberry Z10 can be used by students as a means of practice activities with animation and interactive simulations, thus through this medium may indirectly be a complement to the real laboratory.

Key Words: Simulation Laboratory, smartphone.

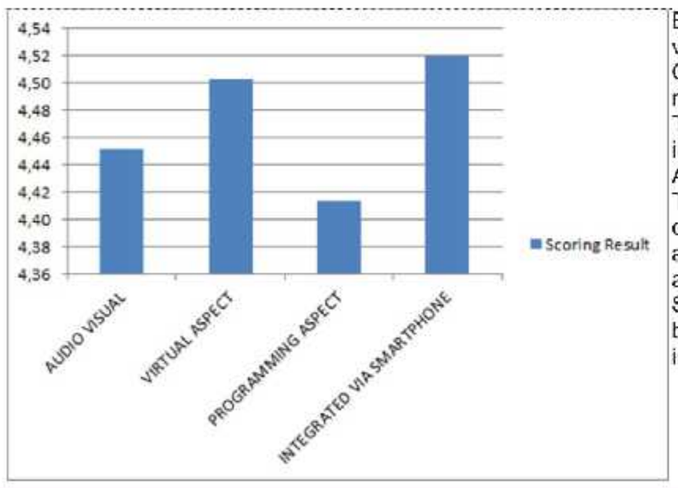
INTRODUCTION

The Mobile Phone (HP) has a special phenomenon for education especially for students. Presence that

Fact the field after the observation is found that there are many high school / vocational school equipment and materials that have very minimal practice, there are even schools that do not have laboratory space, so that the process is not running optimally practicum (Hendra, 2013). Hope students are gaining the knowledge and experience of the results of their study, while teachers' expectations are practical learning process toward the achievement of cognitive changes, psychomotor, and major changes in the character of students (Muslich, 2010).

To overcome these problems, in this research will be developed laboratory-based simulation models of smartphones by utilizing a cell phone blackbery application in this case as a means of practical activities with animation and 3-dimensional simulations (Henderson, 2013). Based on the background of the problem dikemukakakan above, the purpose of this research is formulated as follows: 1) to determine how to develop an integrated simulation model of a laboratory with a smartphone (Blackberry) that can facilitate the practicum process fun for students; 2) to determine how the application of laboratory simulation integrated with smartphones (Blackberry) can facilitate the process of practical vocational students.

To see if a device developed is feasible to use eating required assessment by media experts. Furthermore, media experts Assessment results are shown in Figure Bellow



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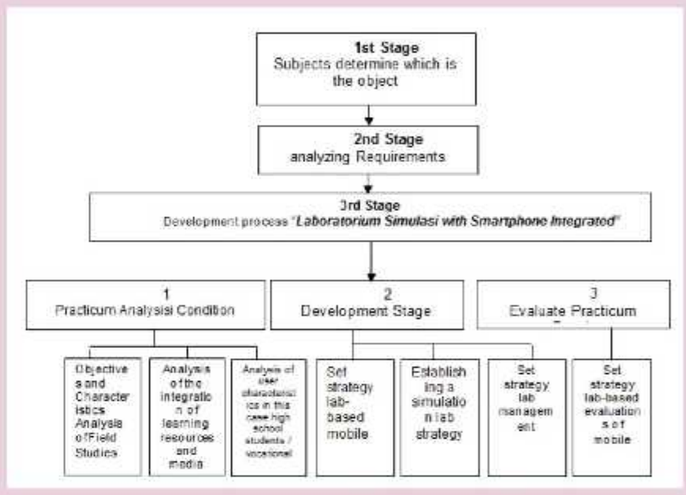
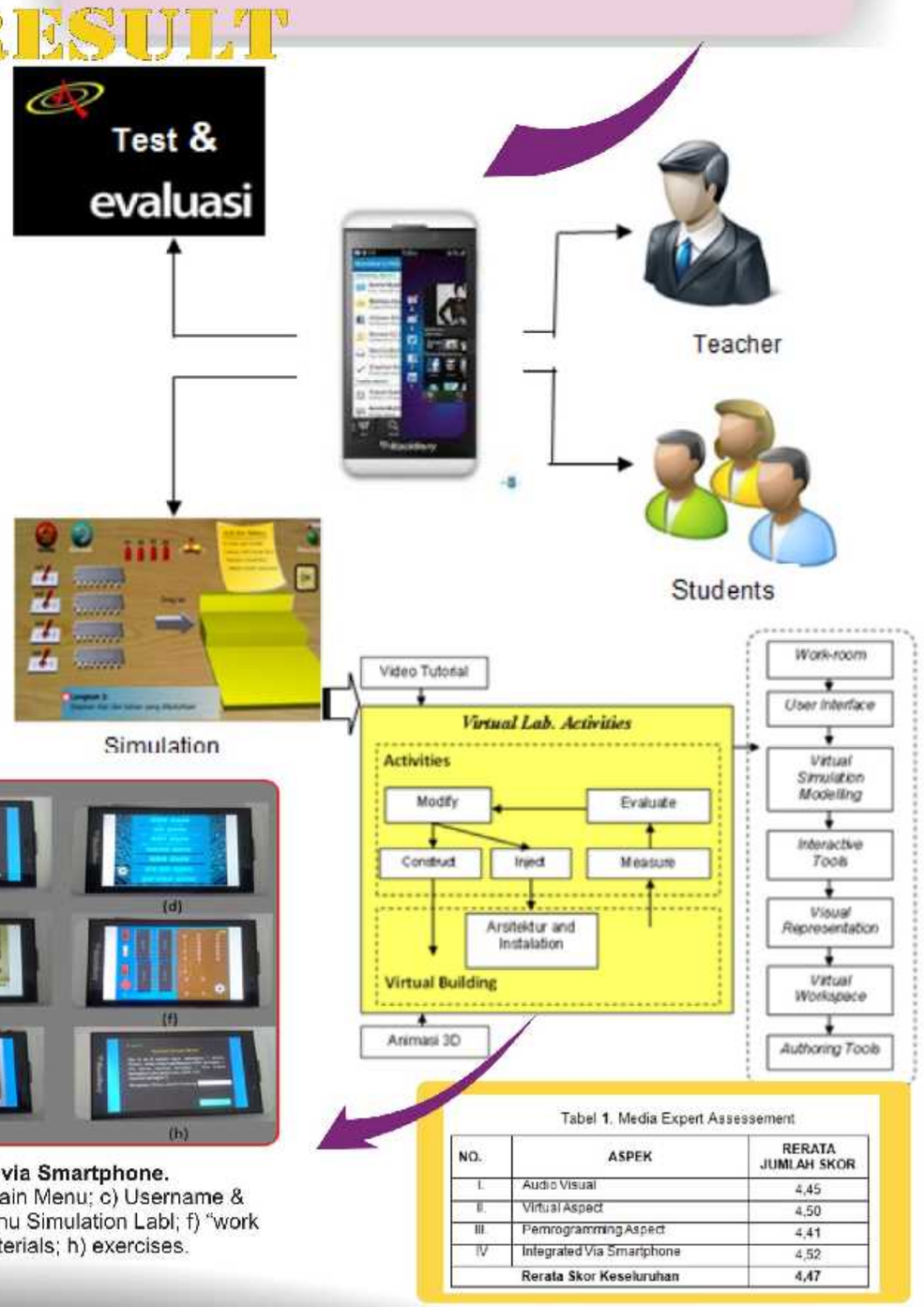
METHODS

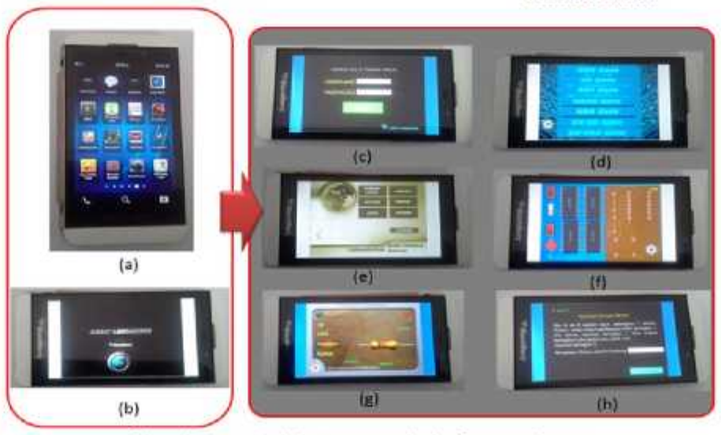
This research is the research and development which refers to the development of Borg & Gall (2003), further design development of the selected media is multimedia development model Lee & Owens (2003). Because the major outcomes that will be generated in the form of a software research, then in the process of media development will be equipped with a special method of software development using the Software Development Life Cycle (SDLC) with Waterfall-based model.

DESIGN DEVELOPMENT OF SIMULATION LABORATORY INTEGRATED WITH SMARTPHONE



RESULT





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Development Stage, Production, and Implementation

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